

Claims

1. An agent for intra-airway administration comprising a compound having a PDE-IV inhibitory activity or a pharmaceutically acceptable salt thereof as an active ingredient which shows its concentration in lung tissues 350-times or more higher than its concentration in plasma when administered into the airway.

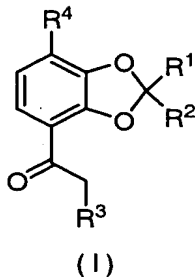
2. An agent for intra-airway administration comprising a compound having a PDE-IV inhibitory activity or a pharmaceutically acceptable salt thereof as an active ingredient which shows its concentration in lung tissues 500-times or more higher than its concentration in plasma when administered into the airway.

3. An agent for intra-airway administration comprising a compound having a PDE-IV inhibitory activity or a pharmaceutically acceptable salt thereof as an active ingredient which shows its concentration in lung tissues 1,000-times or more higher than its concentration in plasma when administered into the airway.

4. An agent for intra-airway administration comprising a compound having a PDE-IV inhibitory activity or a pharmaceutically acceptable salt thereof as an active ingredient which shows its concentration in lung tissues 2,000-times or more higher than its concentration in plasma

when administered into the airway.

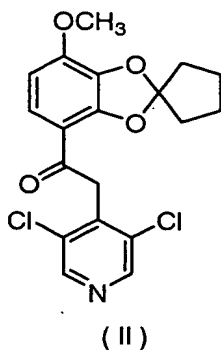
5. The agent for intra-airway administration according to any one of claims 1 to 4, wherein the compound having a PDE-IV inhibitory activity is a compound represented by formula (I)



(wherein, R^1 and R^2 are the same or different and each represents lower alkyl, or R^1 and R^2 , together with the adjacent carbon atom, form a saturated carbon ring; R^3 represents a substituted or unsubstituted aromatic heterocyclic group; and R^4 represents hydroxy or lower alkoxy).

6. The agent for intra-airway administration according to claim 5, wherein R^3 is substituted or unsubstituted pyridyl.

7. The agent for intra-airway administration according to claim 1, wherein the compound having a PDE-IV inhibitory activity is 7-[2-(3,5-dichloro-4-pyridyl)-1-oxoethyl]-4-methoxy-spiro[1,3-benzodioxole-2,1'-cyclopentane] represented by formula (II):



8. A method of treating and/or preventing a respiratory disease, which comprises administering an effective amount of a compound having a PDE-IV inhibitory activity or a pharmaceutically acceptable salt thereof into the airway, which shows its concentration in lung tissues 350-times or more higher than its concentration in plasma when administered into the airway.

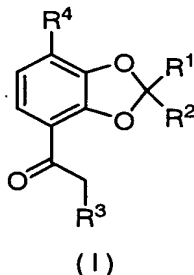
9. A method of treating and/or preventing a respiratory disease, which comprises administering an effective amount of a compound having a PDE-IV inhibitory activity or a pharmaceutically acceptable salt thereof into the airway, which shows its concentration in lung tissues 500-times or more higher than its concentration in plasma when administered into the airway.

10. A method of treating and/or preventing a respiratory disease, which comprises administering an effective amount of a compound having a PDE-IV inhibitory activity or a pharmaceutically acceptable salt thereof into the airway, which shows its concentration in lung tissues 1,000-times or

more higher than its concentration in plasma when administered into the airway.

11. A method of treating and/or preventing a respiratory disease, which comprises administering an effective amount of a compound having a PDE-IV inhibitory activity or a pharmaceutically acceptable salt thereof into the airway, which shows its concentration in lung tissues 2,000-times or more higher than its concentration in plasma when administered into the airway.

12. The method of treating and/or preventing a respiratory disease according to any one of claims 8 to 11, wherein the compound having a PDE-IV inhibitory activity is a compound represented by formula (I)

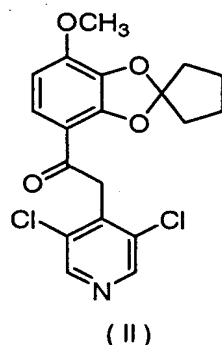


(wherein, R^1 and R^2 are the same or different and each represents lower alkyl, or R^1 and R^2 , together with the adjacent carbon atom, form a saturated carbon ring; R^3 represents a substituted or unsubstituted aromatic heterocyclic group; and R^4 represents hydroxy or lower alkoxy).

13. The method of treating and/or preventing a respiratory disease according to claim 12, wherein R^3 is

substituted or unsubstituted pyridyl.

14. The method of treating and/or preventing a respiratory disease according to claim 8, wherein the compound having a PDE-IV inhibitory activity is 7-[2-(3,5-dichloro-4-pyridyl)-1-oxoethyl]-4-methoxy-spiro-[1,3-benzodioxole-2,1'-cyclopentane] represented by formula (II):



15. The method of treating and/or preventing a respiratory disease according to any one of claims 8 to 14, wherein the respiratory disease is a disease selected from the group consisting of bronchial asthma, chronic obstructive pulmonary disease (COPD), pulmonary emphysema, chronic bronchitis, pulmonary fibrosis, pulmonary hypertension and eosinophilic pneumonia.

16. Use of a compound having a PDE-IV inhibitory activity or a pharmaceutically acceptable salt thereof which shows its concentration in lung tissues 350-times or more higher than its concentration in plasma when administered into the airway, for the manufacture of an agent for intra-airway

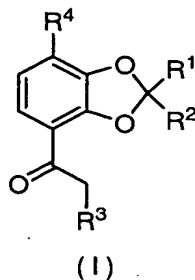
administration.

17. Use of a compound having a PDE-IV inhibitory activity or a pharmaceutically acceptable salt thereof which shows its concentration in lung tissues 500-times or more higher than its concentration in plasma when administered into the airway, for the manufacture of an agent for intra-airway administration.

18. Use of a compound having a PDE-IV inhibitory activity or a pharmaceutically acceptable salt thereof which shows its concentration in lung tissues 1,000-times or more higher than its concentration in plasma when administered into the airway, for the manufacture of an agent for intra-airway administration.

19. Use of a compound having a PDE-IV inhibitory activity or a pharmaceutically acceptable salt thereof which shows its concentration in lung tissues 2,000-times or more higher than its concentration in plasma when administered into the airway, for the manufacture of an agent for intra-airway administration.

20. Use according to any one of claims 16 to 19, wherein the compound having a PDE-IV inhibitory activity is a compound represented by formula (I)



(wherein, R^1 and R^2 are the same or different and each represent lower alkyl, or R^1 and R^2 , together with the adjacent carbon atom, form a saturated carbon ring; R^3 represents a substituted or unsubstituted aromatic heterocyclic group; and R^4 represents hydroxy or lower alkoxy).

21. Use according to claim 20, wherein R^3 is substituted or unsubstituted pyridyl.

22. Use according to claim 16, wherein the compound having a PDE-IV inhibitory activity is 7-[2-(3,5-dichloro-4-pyridyl)-1-oxoethyl]-4-methoxy-spiro-[1,3-benzodioxole-2,1'-cyclopentane] represented by formula (II):

